GOVERNMENT OF INDIA
AGRICULTURE AND FARMERS WELFARE
LOK SABHA

UNSTARRED QUESTION NO:1843
ANSWERED ON:14.03.2017
Productivity of Tobacco
Galla Shri Jayadev

Will the Minister of AGRICULTURE AND FARMERS WELFARE be pleased to state:

(a) whether it is true that scientists Dr. Long and Prof. Krishna K. Niyogi have shown the improvement in photosynthesis and productivity of tobacco crops by accelerating recovery from photoprotection;

(b) if so, the details thereof and the response of the Government thereto; and

(c) whether productivity of food and other crops can be achieved without using GM techniques and if so, the details thereof?

Answer

MINISTER OF STATE IN THE MINISTRY OF AGRICULTURE AND FARMERS WELFARE
(SHRI SUDARSHAN BHAGAT)

(a) Scientists are able to improve the tobacco crop productivity by accelerating recovery from photoprotection.

(b) Dr. S.P. Long and his team at the University of California have shown the improvement in photosynthesis and productivity of tobacco crop by accelerating recovery from photoprotection.

According to these researchers, plant leaves routinely experience sharp fluctuations in levels of absorbed irradiance. Plant leaves dissipate excess absorbed light energy in the form of heat. When leaves are shaded by clouds or other leaves, this protective dissipation continues for many minutes resulting in reduced photosynthesis and loss of potential yield. Over expression of genes involved in photo-protective mechanism that protects the photosynthetic antenna complexes from over excitation is hypothesized to improve crop photosynthetic efficiency and in turn yield.

However, the expression of three identified genes together in tobacco led to increased leaf carbon dioxide uptake and plant dry matter productivity by about 15% in fluctuating light.

(c) So far conventional plant breeding and molecular tools are employed to enhance the productivity of all the major crops grown in India. For example the productivity of rice increased from 668 kg/ha in 1950-51 to 2547 kg/ha in 2016-17 and the productivity of tobacco in India increased from 731 to 1842 kg/ha during the period from 1950-51 to 2014-15.

However, GM technology is required where conventional breeding and other tools are not effective to achieve the desired results particularly in the pest management.

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